

Atty. Dkt. No. 039153-0484 (G1190)

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

No claims are requested to be cancelled.

Claims 1, 5, 7, 10, 13, 15, 16, and 20 are currently being amended.

This amendment changes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-20 are now pending in this application.

On pages 2 and 3 of the Office Action, claims 1-2, 4-8, 10 and 12 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,461,675 (Paranjpe). The Examiner states:

Referring to figures 2, 6, Paranjpe et al. teaches a method of using an adhesion precursor in an integrated circuit fabrication process comprising:

Providing a gas (called precursor, see col. 12, lines 23-24) of first material over a dielectric material to form an adhesion precursor layer, the dielectric material including an aperture (see figure 1); and

Providing a gas including an alloying agent over the adhesion precursor layer to provide a copper layer over the adhesion precursor layer (called precursor, see col. 12, lines 24-26).

Regarding to claim 2, adhesion precursor include a barrier material (col. 12, lines 42-43).

Regarding to claim 4, providing a second gas of a second material over the adhesion precursor layer (called precursor, see col. 12,

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lines 24-26). Noted that second gas can be the gas of the alloy agent to form copper alloy.

Regarding to claim 5, second gas includes chromium (see col. 12, lines 40-44).

Regarding to claim 6, a third gas of the third material over a layer formed by the second material.

Applicants respectfully traverse the rejection.

On pages 3-4 of the Office Action, claims 15-16 and 19 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2004/0105934 (Chang). The Examiner states:

Referring to figures 51-5c, Change et al. teaches a method of using an adhesion precursor for chemical vapor deposition, the method comprising:

Forming a trench (304H) in a dielectric layer (302);

Forming a continuous barrier layer (308) above the dielectric layer and along sides of the trench;

Depositing copper (310) above the continuous barrier layer, the copper located in the trench forming an integrated circuit feature, wherein the continuous barrier layer (308) includes a material selected from a group consisting of Ir, Ru, Re (see abstract, and paragraphs #80).

Regarding to claim 16, the continuous barrier layer is formed from a gas having a ternary element (see paragraph #59). Noted that the precursor gas containing at least ruthenium, oxygen, carbon and hydrogen.

Regarding to claim 19, feature is a via (see figure 5a).

Applicants respectfully traverse the rejection and reserve the right to swear behind Chang.

On page 4 of the Office Action, claims 15-16 and 19 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,790,773 (Drewery). The Examiner states:

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Referring to figures 2a-3c, Drewery et al. teaches a method of using an adhesion precursor for chemical vapor deposition, the method comprising:

Forming a trench (202) in a dielectric layer (200);

Forming a continuous barrier layer (204/210/304) above the dielectric layer and along sides of the trench;

Depositing copper (212) above the continuous barrier layer, the copper located in the trench forming an integrated circuit feature, wherein the continuous barrier layer (204/210/304) includes a material selected from a group consisting of Ir, Ru, Re (see col. 5, lines 34-40, claim 16).

Regarding to claim 17, CMP the copper layer (see figure 2E, col. 7, lines 18-22). Regarding to claim 19, feature is a via (see figure 2a).

Applicants respectfully traverse the rejection and reserve the right to swear behind Drewery.

On pages 5 and 6 of the Office Action, claims 3-11, 14 and 18 are rejected under 35 U.S.C. § 103 as being unpatentable over Paranipe, Drewery or Chang in view of one of ordinary skill in the art. Applicants respectfully traverse the rejection.

On page 6 of the Office Action, the Examiner has allowed claim 9 and indicated that the subject matter of claims 13 and 20 is allowable. To advance prosecution, Applicants have amended each of independent claims 1, 5, 7, 10 and 15 to include a feature related to the use of a ternary element of Iridium (Ir), Ruthenium (Ru) and Rhenium (Re). Accordingly, it is respectfully submitted that independent claim 1 and its dependent claims 2-4 and 6, independent claim 5, independent claim 7, independent claim 10 and its dependent claims 11-14 and independent claim 15 and its dependent claims 16-20 are patentable over Paranipe, Drewery or Chang.

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Applicants believe that the present application is now in condition for allowance.
Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1447. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 06-1447.

Respectfully submitted,

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By Joseph N. Ziebert

FOLEY & LARDNER LLP
Customer Number: 26371
Telephone: (414) 297-5768
Facsimile: (414) 297-4900

Joseph N. Ziebert
Attorney for Applicant
Registration No. 35,421